Amended Claims

1. (Currently amended) A ~~semiconductor~~ light emitting device including:

a ~~semiconductor device~~ light emitting die having a light-emitting principal side and a die bonding principal side opposite the light emitting principal side;

a heat-sinking support structure on which the ~~semiconductor device~~ die bonding principal side of the light emitting die is disposed, the light-emitting principal side of the light emitting die facing away from the heat-sinking support structure to emit light; and

nanotube regions containing nanotubes arranged between ~~on a surface of or in~~ the heatsinking support structure and ~~or on~~ the ~~active device~~ die bonding principal side of the light emitting die, the nanotube regions arranged to contribute to heat transfer from the ~~semiconductor device~~ light emitting die to the heat-sinking support structure.

2. (Currently amended) A ~~The~~ semiconductor device ~~as set forth in claim 1, wherein~~ comprising:

a ~~the~~ semiconductor device die ~~includes~~ including die electrodes arranged on the semiconductor device die[[,]];

a ~~the~~ heat sinking support structure ~~further including:~~ on which the semiconductor device die is disposed;

nanotube regions containing nanotubes arranged on a surface of or in the heatsinking support structure or on the semiconductor device die, the nanotube regions arranged to contribute to heat transfer from the semiconductor device die to the heat-sinking support structure; and

contact pads defined by at least some of the nanotube regions, the contact pads electrically and mechanically contacting the die electrodes.

3. (Original) The semiconductor device as set forth in claim **2** wherein the contact pads further include:

a conductive coating disposed over the nanotube region.

4. (Original) The semiconductor device as set forth in claim **3**, wherein the conductive coating includes:

an adhesion layer,

a barrier layer; and

a directly bondable layer disposed over the barrier layer.

5. (Original) The semiconductor device as set forth in claim **3**, wherein the conductive coating includes:

a gold layer thermosonically or thermocompression bonded with the die electrodes.

6. (Original) The semiconductor device as set forth in claim **2**, wherein the nanotubes of the contact pads are generally parallel to one another and extend away from the heat-sinking support structure.

7. (Original) The semiconductor device as set forth in claim **2**, wherein each contact pad includes:

a generally planar catalyst layer disposed on the heat-sinking support structure; and

generally aligned nanotubes that extend away from the catalyst layer.

8. (Original) The semiconductor device as set forth in claim **2**, wherein the semiconductor device die includes:

a light emitting diode device die having a flip-chip die electrode configuration.

9. (Original) The semiconductor device as set forth in claim **2**, wherein the nanotubes of the nanotube regions that define contact pads are predominantly nanorods.

10. (Currently amended) A ~~The~~ semiconductor device ~~as set forth in claim 1, wherein the heat-sinking support structure further includes~~ comprising:

a semiconductor device die;

a heat-sinking support structure on which the semiconductor device die is disposed;

nanotube regions containing nanotubes arranged on a surface of or in the heatsinking support structure or on the semiconductor device die, the nanotube regions arranged to contribute to heat transfer from the semiconductor device die to the heat-sinking support structure; and

microchannels arranged laterally in the support structure, at least some of the nanotube regions being disposed inside the microchannels.

11. (Original) The semiconductor device as set forth in claim **10**, further including:

a thermal transport fluid disposed in the microchannels.

12. (Original) The semiconductor device as set forth in claim **11**, further including:

an active cooling system that circulates the thermal transport fluid through the microchannels.

13. (Original) The semiconductor device as set forth in claim **12**, wherein the active cooling system is a recirculating active cooling system that includes a pump and a heat exchanger.

14. (Original) The semiconductor device as set forth in claim **10**, wherein the nanotubes disposed inside the microchannels are oriented generally perpendicular to the microchannels.

15. (Original) The semiconductor device as set forth in claim **14**, wherein the nanotubes are predominantly nanosprings.

16. (Original) The semiconductor device as set forth in claim **10**, further including:

a catalyst layer coating surfaces of the microchannels, the nanotubes disposed inside the microchannel extending generally away from the catalyst layer toward a center of the microchannel.

17. (Original) The semiconductor device as set forth in claim **10**, wherein the heat-sinking support structure further includes:

a first structure part with a first joining surface; and

a second structure part with a second joining surface parallel to the first joining surface, the first and second joining surfaces securely contacting one another, the microchannels being defined by grooves in at least one of the first and second joining surfaces.

18. (Original) The semiconductor device as set forth in claim **17**, wherein at least one of the first and second joining surfaces includes:

an oxide layer that anodically bonds the first and second joining surfaces together.

19. (Original) The semiconductor device as set forth in claim **10**, wherein the microchannels have a cross-sectional shape selected from a group consisting of circular, rectangular, square, triangular, octagonal, and pentagonal.

20-33. (Canceled)